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RESEARCH ARTICLE

An Irish soldier perceives the stars: Philip O'Sullivan Beare's exegetic cosmology, c. 1626–30

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Argument
Between 1621 and 1626, the soldier-historian Philip O'Sullivan Beare authored treatises to motivate Catholic powers toward greater intervention in Ireland, and to defend his country's honor more generally. Moving beyond political theology, the author's unfinished manuscript *Zoilomastix* incorporated natural history and astronomy. The current article draws attention to a previously overlooked fragment wherein the Irishman considered contemporary debates on the structure of the heavens. It first considers the material history of the fragment, before exploring the influence of continental pedagogic and military networks upon the author. The paper then presents evidence of O'Sullivan Beare's adherence to Thomist, Bellarminian cosmology, and of his disagreement with Clavius and Galileo, via Jacques du Chevreul's 1623 commentary on Sacrobosco's *Sphere*. Contrasting the fragment's contents with the cosmogony published in the author's *Patritiana decas* (1629), it demonstrates that these exegetic readings were part of the author's wider strategy for "making truth" amidst shifting political, confessional, and cosmological paradigms.

Keywords: history of astronomy; Ptolemaic astronomy; Copernican astronomy; Mosaic physics; Irish history; history of religion; early modern intellectual networks

Writing from exile in the late 1620s, the Irish soldier-historian Philip O'Sullivan Beare (1590–1636?) marshaled a range of *auctores* to consider developments in the study of astronomy (fig. 1; O'Sullivan Beare 1626–30, fol. 358r–359v [hereafter, *Zoilomastix*]). Some, such as the Jewish astrologers Abraham Ibn Ezra (c. 1089/92–c. 1164/67) and Abraham Zacuto (1452–1515?), followed Hipparchus (c. 190–c. 120 BC) in postulating cosmological models consisting of nine celestial spheres. Others, such as Georg von Peurbach (1423–61) and his student Regiomontanus (1436–76), adapted Arabic and Alfonsine additions of a tenth sphere to account for observed variations in the precession of the equinoxes. Succeeding Johannes de Sacrobosco's introductory *De sphaera mundi* (*On the Sphere of the World*, c. 1230), Peurbach's *Theoricae novae planetarum* (*New Theories of the Planets*, 1454) presented advanced syntheses of Ptolemaic astronomy and Aristotelian physics, solidifying the transmission of the celestial spheres and the accompanying equants, eccentrics, and epicycles required to explain heavenly bodies' motions (Grant 1994, 302–23 and 376–82; Barker 2011, 9–12).[1] In their response to Nicolaus Copernicus' (1473–1543) heterodox heliocentrism, the Jesuits Christoph Clavius (1538–1612) and Giovanni Antonio Magini (1555–1617) proposed an eleven-sphere system, one which accepted the Polish

[1]For comprehensive treatments of the early modern commentaries on, and the publication history of editions of, Sacrobosco's *De sphaera*, see also Valleriani 2020 and Valleriani and Ottone 2022.

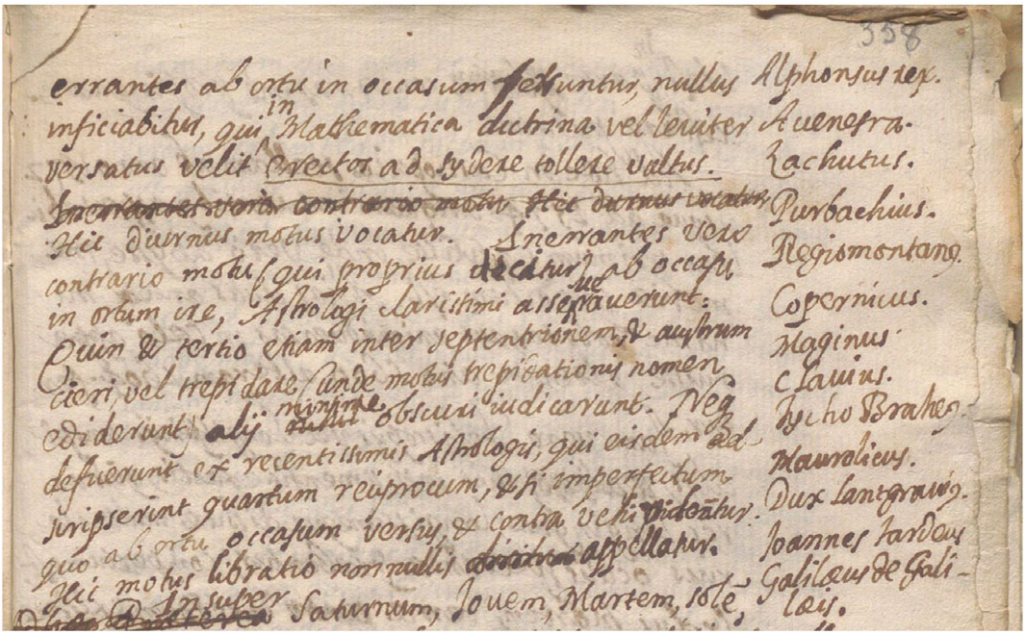

Figure 1. Philip O'Sullivan Beare's indexing of astronomical authorities (right margin), likely taken from his reading of Jacques du Chevreul's *Sphere*. From top to bottom: King Alfonso X (Alphonsus rex); Abraham Ibn Ezra (Avenetra); Abraham Zacuto; Georg von Peurbach; Regiomontanus; Nicolaus Copernicus; Giovanni Antonio Magini; Christoph Clavius; Tycho Brahe; Francesco Maurolico; Wilhelm IV, Landgrave of Hesse-Kassel (Dux Lantgraviis); Jean Tarde; and Galileo Galilei. Uppsala University Library, H248, fol. 358r.

astronomer's calculations, even as it encouraged rejection of his underlying premises. Nearing the end of his life, Clavius noted that Galileo Galilei's (1564–1642) recent observations appeared to demand an entirely new world-system.[2] For his "children" Giuseppe Biancani (1566–1624) and Christoph Scheiner (1573/75–1650), this new astronomy would not add further spheres and orbs—rather, it advocated for their dissolution (Biagioli 1993, 273–77).[3]

Written between the 1616 prohibition of heliocentrism and Galileo's formal condemnation of 1633, O'Sullivan Beare's fragment acknowledges several issues at play in a period where the scholastic and scriptural fideism woven into Roman Catholic identities became entangled with a growing appreciation of anti-Aristotelian and, in some cases, Copernican heterodoxy. It touches upon wider trends in the changing disciplinary status of mathematics—including the use of instruments, and overarching debates concerning epistemological and exegetical certainty—and demonstrates that even citizens of the poorest and most remote parts of Catholic Europe engaged vigorously with such debates. Furthermore, these astronomical notes warrant exploration from the perspective of the exile's personal agenda. They occupy a liminal role between O'Sullivan Beare's religio-political and hagiographic publications and the idealized texts on natural history, astronomy, and military science he planned to write, and illustrate the author's accommodation of multiple theoretical positions across interlinked modes of enquiry. Evidence of this technical reading therefore has much to tell us of novice and expert scholastic responses to the post-Galilean universe, as well as the role of disciplinary genres in the creation of identity and purpose in exile.

[2]Clavius (1612b, 75): "Quae cum ita sint, videant Astronomi, quo pacto orbes coelestes constituendi sint, ut haec phaenomea possint salvari."

[3]For rejections of Aristotle on the grounds of physico-mathematical astronomy, see Biancani (1615, 1620) and Scheiner (1626–30).

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Despite these considerations, the fragment has most often been described as the scraps of an "abandoned" work, and subsequently ignored (Gwynn 1934, 2; O'Donnell 1960, xiv; O'Sullivan 2009, 18). To resolve this, the current article places O'Sullivan Beare's exegetic cosmology in its correct contexts. It first considers the notes' material history, before exploring the nature of their author's exile, and the influence of continental pedagogic and military networks on his work. A discussion of the physical and mathematical crosscurrents present in Catholic astronomy between 1570 and 1620 precedes analysis of O'Sullivan Beare's Thomist, quasi-Bellarminian cosmology and his disagreements with the models of the universe propounded by Clavius, Galileo, and others. Contrasting these interpretations with the cosmogony published in the later *Patritiana decas* (*A Life of St Patrick*, 1629), the article then concludes by demonstrating that this astronomical fragment was by no means "abandoned." Rather, its content was retailored hermeneutically as part of the author's efforts to use *historia* to complement early modern epistemic genres in a wider strategy for "making truth."

A strategy for truth: The fragment's collection and context

The four octavo-sized folios of astronomic notes were written in O'Sullivan Beare's legible, italic hand and bound with his larger Latin manuscript *Zoilomastix* (*A Whip for Zoilos*), an unpublished natural history of 360 folios repudiating the propaganda of the Anglo-Norman topographer Gerald of Wales (c. 1146–c. 1223) and the "Old English" Palesman Richard Stanihurst (1547–1618).[4] Asserting that the minor Gaelic nobleman worked on this vindicatory natural history between 1624 and 1626, Aubrey Gwynn (1934, 4) pointed to in-text references to the 1624 publication of Thomas Messingham's (1575?–1638?) *Florilegium insulae sanctorum* (*The Lives and Proceedings of the Saints of Ireland*), and to reference to the death of the Catholic archbishop and political agent Peter Lombard (c. 1554–1625) in the following year. Based on its reliance on Jacques du Chevreul's commentary on the *Sphere* (1623) and the lack of references to works such as Christoph Scheiner's *Rosa Ursina* (The Rose of Orsini, 1626–30), I argue that the fragment was written in the same period. Full of corrections and marginal notes, *Zoilomastix* was revised repeatedly until c. 1629 in collaboration with other exiled Irish figures influenced by the political and religious thought of Lombard, Florence Conroy (c. 1560–1629) and Luke Wadding (1588–1657) (O'Sullivan Beare 1629, fol. 130r–v). The fragment's contents are heavily edited and begin and end *in media res*, suggesting that they belonged to a more detailed astronomical argument similarly reworked over time.

Zoilomastix belonged to the Marquis of Astorga before its purchase in June 1690 by Johan Gabriel Sparwenfeld (1655–1727). An itinerant collector and recalcitrant correspondent of Gottfried Wilhelm Leibniz (1646–1710), Sparwenfeld inclined towards scholarship arguing that certain European vernaculars were linked either to Hebrew or a mythical "Scytho-Celtic" *ur*-language. During his employment in the service of King Carl XI of Sweden (1655–97), he contributed to Gothic pseudo-histories heralding Sweden as the cradle of European civilization (Gwynn 1934, 4; McKendry 1997, 525–29; McKendry 1999, 183–87).[5] The collector's interest in the manuscript volume owed to the polyglot nature of its contents, its arguments concerning the mythologized genealogical and linguistic roots shared by Spanish and Irish peoples, and its attempts to reconstitute national and supra-national identities. The *leitmotif* linking *Zoilomastix*'s treatments of state, faith, and world-system was its author's overweening preoccupation with the

[4]The term "Old English" is here used generally to apply to Anglo-Norman Catholic families resident in Ireland from the twelfth-century onward, often clustered in The Pale and in large Irish townships, and discrete from those arriving in Ireland either as part of or following the Tudor conquest. A significant body of scholarship exists on this community's culture, outlook, and confessional identities in the sixteenth and seventeenth centuries. Useful introductions are provided in Canny 2001 and Canning (2019).

[5]On Leibniz' interest in historical linguistics, see Walker 1972 and Hawkins 2018.

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creation of authoritative "truth" through scriptural exegesis, the examples of learned forebears, and analytical methods. In this regard, Philip O'Sullivan Beare's literary practice was no different to the many continental Catholic historiographers for whom *historia* functioned as a core legitimator in theological and juridical debates, and as a tool to critically analyze contested narratives and their sources (Badea 2021, 193).

The author's first publication, *Historiae Catholicae Iberniae compendium* (*A Catholic History of Ireland*, 1621), followed the Spanish court historian Juan de Mariana (1536–1624) and O'Sullivan Beare's compatriot and literary model Peter Lombard in conflating Protestantism with heterodoxy. Its crusading rhetoric was reminiscent of Lombard's *De regno Hiberniae* (*Of the Kingdom of Ireland*), written at the behest of the Earl of Tyrone Hugh O'Neill (c. 1550–1616) to garner papal favour.[6] But unlike the archbishop, who could in 1598 portray recent insurgencies as divinely inspired victories indicative of eventual and eternal triumph, by 1621 O'Sullivan Beare was required to reinterpret defeats in Ireland and elsewhere as a clarion call for greater military intervention. The juxtaposition of truth against heresy, weaponized in service of Spanish Catholic hegemony and Irish natural rights, was continued in *Zoilomastix*, in the polemic *Archicornigeromastix* (*A Whip for the Arch-Horned One*), written against the Protestant Archbishop James Ussher (1581–1656), and in portions of *Patritiana decas*, the latter pair published in 1629 (Carroll 2001, 106–7; Campbell 2013, 87–102). Turning entirely to hagiography, the author's oeuvre concluded with technical religious history. Prior to his death circa 1636, the "soldier of fortune" vigorously petitioned Jean Bolland (1596–1665) to add his contributions on the lives of Irish saints to the first edition of the *Acta Sanctorum* (*Acts of the Saints*, 1634) (Grosjean 1963).

Although he was linked to the expatriated Irish authors who followed Lombard in writing tracts on political theology from abroad, the soldier-historian must also be considered as part of a broader, interdependent network of mobile practitioners maintained by state patronage. Drawing upon identifications of the long sixteenth century as "the century of the soldier," Rivka Feldhay has recently suggested that the period's wars provide essential context to the connected political, theological, and disciplinary modes of thought that subsequently emerged. Influential theologians and humanists including Cardinal Robert Bellarmine (1542–1621) and Jean Bodin (c. 1530–96) emphasized "the historicity and contingency of the political world," yet acknowledged "the threat of tearing themselves away from the metaphysical and theological anchorage" of Christian faith and Aristotelian philosophy. Nevertheless, these authors were "enchanted" by the purportedly analogous link between the supremacy of divine power and the earthly absolutism available to sovereigns.[7] The uses and limitations of such power can be analyzed, Feldhay contends, in the relationship between the state and the Church, and in the entangled processes of state-sponsored knowledge-making intellectually theorized at court and practically tested on the battlefield (Feldhay 2021, 310–14). A scion of impoverished nobility forcibly removed from elevated social status in his homeland, Philip O'Sullivan Beare represents a lesser order of the hybrid practitioners engendered by these wars' conflict zones, literal and figurative. Despite his high birth, his experience was also somewhat representative of the early modern Irish diaspora.

Following the end of the "Kildare Ascendancy" in 1534 and the Acts of Supremacy of 1537 and 1560, successive Tudor and Stuart governments had increasingly prohibited Catholic access to education, roles in civic office, and religious expression.[8] Against this backdrop of confessional

[6]Following its late sixteenth-century circulation in manuscript, Lombard's work was later published in Leuven (Lombard 1632).

[7]The impact of Bodin's anti-Aristotelian theory of sovereignty on seventeenth-century Irish and English authors is detailed in Campbell 2010.

[8]The literature on these inter-related topics is vast, and an exhaustive list is beyond the scope of the current article. Useful overviews are provided in Canny 1989, 98–99; O'Connor and Lyons 2006; Edwards 2007; Harris and Sidwell 2009; and Gillespie and Ó hUiginn 2013. The erasure of Gaelic culture is treated by, amongst others, Ellis 1999 and Palmer 2014. A comparative analysis of the nature of this violence is found in Kane 2014.

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and geopolitical intolerance, ever-greater numbers of Gaelic Irish and Old English journeyed abroad to study, to train for the priesthood, to fight in foreign armies, and to seek sympathy on the basis of shared heritage (see O'Doherty 1913; Henchy 1981, 220; Brockliss and Ferté 1987; Henry 1992; Fenning 2005; Nilis 2006; Ó hAnnracháin 2014, 14; O'Scea 2015, 41–46). Soon after their arrival, many male emigrants were subsumed into the Jesuit Order's hegemonic structures of seminaries and colleges. Mandated by Ignatius Loyola (1491–1556) to display their missionary value on religious, pedagogical, and practical grounds, these institutions operated according to the *Ratio studiorum*, where Aristotelian philosophy, Ciceronian rhetoric, and Thomistic theology were respectively dominant. Large numbers of Irish students were thus educated according to the Society's conservative *modus Parisiensis*, in which a three-year philosophy course combined logic in the first year with physics, metaphysics, ethics, and, occasionally, mathematics, in the second and third (Chambers 2009, 213). The form and movement of the cosmos were communicated through commentaries on Aristotle's *Physics* and *On the Heavens*, the central planks of scholastic natural philosophy and metaphysics (Padberg 1996, 157 and 184–85). Whether at its first institution in Messina or the later power-center of the Collegio Romano, Jesuits such as Jerónimo Nadal (1507–80), Balthasar Torres (1518–61), and Christoph Clavius strove to incorporate practical and theoretical teaching in mathematical disciplines into the Society's curriculum, Clavius passionately arguing that, left uneducated in basic grammar, rhetoric, and mathematics, generations of youthful Catholic nobility would be forever lost to the persuasive Protestantism of Philip Melanchthon (1497–1560) and Peter Ramus (1515–72) (Clavius [1594] 1992).

These proposed curricula were initially disregarded, and mathematics retained its standard premodern position in Thomist arguments. Mathematics was considered subordinate to physics, and the science least capable of demonstrative power—even when employed in "mixed" subjects such as astronomy (Ariew 1990; Mancosu 1996, 8–33; Udías 2015, 9–14). In tandem with wider social developments, ongoing sixteenth-century debates concerning scholastic method and demonstrative certainty, however, demanded Catholic educators engage more closely with mathematical disciplines. Jesuit institutions of the early seventeenth century thus presented the study both as a useful tool for divine contemplation, and as a series of applied arts including surveying, navigation, hydrostatics, and military fortification that might aid the world-making projects of princes, city fathers, and various branches of government and military alike (Baldini 1992; Romano 1999). Following the suggestions of Torres and, particularly, the belligerent lobbying of Clavius, students were by the early seventeenth century familiar with the first books of Euclid, with practical arithmetic, and with the *Sphere*, before graduating to the handling of instruments, to planetary *theoricae*, and to practical geometry and dialing, or time-finding (Torres [1557–1560] 1974, 434).[9] Under the aegis of the preeminent German mathematician, Jesuit theoreticians, pedagogues, and missionaries all traded successfully upon their mathematical capabilities—whether ensconced in Rome, implanted in schools across Europe, or engaged in questionable missions elsewhere.

Recounting his childhood escape from the armies of the English Crown in paratextual letters appended to his *Compendium*, O'Sullivan Beare considered the effects of Counter-Reformation political contingency and pedagogy alike. The Irish clergyman Patrick Synnott (fl. 1590–1623) had educated the soldier-historian in the *trivium*, with instruction in physics and philosophy provided by the Spanish fathers Rodrigo de Vendaña (fl. 1602) and Pedro Marcilla (fl. 1602), respectively (O'Sullivan Beare 1621, 182).[10] A lecturer in rhetoric at the University of Santiago de Compostela, Synott supplemented his income with financially useful though theologically ill-advised readings in judicial astrology, which were terminated upon Inquisitorial command in 1622 (O'Connor 2016, 82–83). O'Sullivan Beare's friend and fellow soldier Gerald Trant (fl. 1602–21), meanwhile,

[9]See also Romano 1999, 71–83 and Gatto 2006, 238.

[10]O'Sullivan Beare's education took place at the Irish College of St. James, Compostela, established thanks to his kinsman, Donal Cam O'Sullivan (1561–1618), and the nearby University of Santiago de Compostela (Morgan 2009).

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fled a besieged Castlehaven in 1602 before serving in Irish military units in the Spanish Netherlands. Afterwards, he settled in an enclave close to his countrymen, and requested in 1616 that his military pension be transferred to La Coruña (M. 1914, 239; O'Scea 2014, 69). In correspondence with Synnott, O'Sullivan Beare lamented that war's barbaric theater left little room for the elegance of Cicero and Lorenzo Valla (1407–1457). In Trant, he confided that the peaks and troughs of naval life interrupted his willing study of astronomy.[11] Nevertheless, the soldier promised to continue his reading in whatever free time he might have, and to build upon the lessons of Synnott, Trant, and two years of practical experience in the military arts.[12]

Returning to court in search of patronage and influence, O'Sullivan Beare joined the expatriated Gaelic Irish and Old English Catholics jostling for primacy in relation to college administration, military strategy, political theory, and theological interpretation (Carroll 2001, 116–20). These coteries perceived religious historiography as a vehicle to rescue their nation's past, present, and future from heterodox Protestantism. Uniquely, O'Sullivan Beare's bellicose polemic was inflected by his continuing interest in astronomy and other "epistemic and erudite genres" (Pomata and Siraisi 2005, 5)—a direction attributable, in Feldhay's terms, to his interdependent networks, and to his experience within the ecumenical and political power structures that explicitly constructed authority through liberal and military arts. Racing to another frontline, the lifelong combatant saw the cosmological arguments of the 1620s as battles in which the validation of scriptural and historical authorities and the observational techniques of physico-mathematical astronomy were weapons in a grander struggle. To this end, the example of Peter Lombard demonstrated how treatises on divine grace and Irish politics could carry one to great heights. A contemporary of Robert Bellarmine and trusted advisor to Pope Paul V (Camillo Borghese, 1550–1621), Lombard had acted as head of the 1616 committee tasked with adjudicating heliocentric heresy (Silke 1975). Although he lacked the academic theologian's standing, O'Sullivan's desire to join contemporary debates on the cosmos nevertheless represented the marriage of his personal and professional identities. His education had familiarized him with the Aristotelian foundations of natural philosophy, as well as introductory lessons on arithmetic, geometry, and the *Sphere*. He had experienced military science in theory and practice, and his time in the Spanish Navy incorporated celestial navigation and the use of instruments. Allied to his turn to *historia*, such experiences convinced the author of his capability to determine authoritative "truth" amidst conflicting paradigms.

The fragment's background: Catholic responses to cosmological change

Developments in late sixteenth- and early seventeenth-century astronomical theory witnessed Catholic thinkers' convergence into two distinct cosmological camps (Bellarmine [1570] 1984, 13; Blackwell 1991, 29–51 and 164; Galluzzi 2017, 171–78). One group was physical, and faithful to the traditional teaching of scriptural evidence and subsequent Patristic interpretation as taught by figures such as by Bellarmine. In his *Lectiones Lovanienses* (*Leuven Lectures*, 1570–72) on Thomas Aquinas' (1225–74) *Summa theologica* (*Summary of Theology*), the theologian rejected the spheres of the Ptolemaic world-system. Instead, referencing the hexameral writings of Basil of Caesarea

[11]O'Sullivan Beare (1621, 272–73 and 279): "Ego hic non Ciceronianas elocutiones, non Vallae, non Manutii elegantias, sed nauticas voces novas, atque barbaras percipio. . . . Quamquam enim exercitatione armorum, marinaque iactatione impeditus vix ocium studio suppeditare possum, et id upsum, quod ocii datur, in Astronomia quam libentissime consumo: tamen quidquid temporis mihi vel navigandi difficultas, vel armorum occupatio, vel Astronomicarum rerum contemplatio tribuit, id ad scribendum potissimum contuli, ut animo tuo gererem morem."

[12]O'Sullivan Beare (1621, 279): "Biennium est, quam in regio classe studio militaris artis animum intendo. Prioris anni res gestas Paulo fusius persecutes Patritio Sinoto misi. Posterioris casus breviter complexus tibi dedico." During his time in the royal fleet, O'Sullivan Beare likely received both formal and informal training as recommended in the slew of Spanish military manuals generated from the late sixteenth century onwards. See Gonzalez de Leon 1996; Sandman 2004; and Portuondo 2009, 60–66.

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(330–79), John Chrysostom (347–407), and John Damascene (676–749), Bellarmine proposed that the Earth sat still at the center of a trio of airy, starry, and empyreal heavens. The first was akin to terrestrial atmosphere. The second was a fluid region of penetrable, corruptible, and fiery matter, where celestial bodies moved in non-uniform spirals, free from crystalline spheres. The third resembled a dimension reflecting all light, in which the Deity resided. Though unable to produce a model of this world-system, Bellarmine believed his construction conformal with sensory evidence and with biblical teaching, arguing that any additions to these three heavens were merely hypotheses of mathematical astronomers (Bellarmine [1570] 1984, 16–17 and 19–20). Indifferent to the vacuity of Bellarmine's mathematics, subsequent Catholic natural philosophers instead celebrated the theologian's physics, in which they perceived presentiments of the revolutions inspired by the nova of 1572 and the comets of 1577 and 1618.

The second group was mathematical, and a product of Clavius' efforts to syncretize Ptolemaic astronomy with contemporary observational data. In commentaries on the *Sphere* popular for decades thereafter, the German pedagogue maintained that Scripture and portions of Aristotelian physics agreed with Ptolemaic principles. Clavius' adherence was, however, open to minor changes—particularly when confronted with explanations that might save observable phenomena. As a result, editions of his textbooks written after 1572 saw him accept the possible corruptibility of the heavens, *contra* Aristotle, though never their fluidity, *pro* Bellarmine, Tycho, and others. Although Clavius had in his early commentaries sought to retain trepidation as part of the geocentric cosmos, by 1581 his own wavering had begun.[13] Nevertheless, the Jesuit mathematician strove to maintain a geometric rationale for celestial kinematics, designing orthodox *theoricae* of eccentrics, epicycles, and equants that might simultaneously accommodate Copernicus' mathematical data while allowing rejection of the "absurdities" of his attendant physical and exegetical conclusions (Lattis 1994, 145–73). On the basis of their loyalty to Ptolemaic cosmology, and thanks in no small part to Tycho Brahe's confessional identity, Catholic theorists initially rebuffed the proposals made in *De mundi aetherei recentioribus phaenomenis* (*Recent Phenomena in the Celestial World*, 1588). In direct opposition to Bellarmine, both Clavius and his sometime opponent, the powerful Spanish Jesuit philosopher Benedict Pereira (1536–1610), rejected the idea of fluid heavens out of hand, with the former refusing to mention Tycho by name in his work.

Before his death in 1612, Clavius was a careful supporter of Galileo, a mentor to his successors Christoph Grienberger (1561–1636) and Christoph Scheiner, and an acquaintance of the French Catholic clergyman Jean Tarde (1561/62–1636). In their debates on naked-eye and telescopic observations of comets, novae, and sunspots, Catholic astronomers between 1611 and 1633 thus initially followed their master's lead by accommodating the undeniable aspects of Galilean theory without accepting the Italian astronomer's Copernicanism. Inevitably, this meant wrestling (albeit subtly, under the threat of censorship) with the fissures revealed in Aristotelian physics and Ptolemaic cosmology, whose now-crumbling façade strengthened the Bellarminian view that such models had outlived their usefulness. Inheritors of the Ptolemaic tradition included the Collège d'Harcourt professor Jacques du Chevreul (1595–1649), whose popular 1623 textbook repositioned spherical astronomy in a fundamentally post-Galilean framework. To do so, du Chevreul retained as much Ptolemaic theory as was possible, adding yet more epicycles and eccentrics to explain recent celestial novelties (du Chevreul 1623, 176–81; Ariew 2006, 107). By the time of this anti-Tychonic (if only semi-Galilean) publication, however, a new generation of astronomers had already begun to transmit the Danish astronomer's geoheliocentric world-system via careful historical and philosophical reinterpretation.

[13]Trepidation is the proposed oscillation of the eighth heavenly sphere, whose introduction to the Ptolemaic system was attributed to Thābit ibn Qurra (826/36?–901) and adapted by Alfonsine astronomers to explain variations in the precession of the equinoxes.

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When constructing iterations of his model between 1578 and 1588, Tycho followed his precursor Valentin Naibod (1523–93) and his contemporary Paul Wittich (1546–86) by co-opting Martianus Capella's (fl. c. 410–20) didactic *De nuptiis Philologiae et Mercurii* (*On the Marriage of Philology and Mercury*). Winning praise from Copernicus (who, Naibod claimed, owed Martianus rather more gratitude than had been implied), Capella's system had the spheres of Venus and Mercury circle the Sun, which, along with the spheres of the remaining "superior" planets, then circled the Earth.[14] In *Disquisitiones mathematicae de controversis et novitatibus astronomicis (Mathematical Disquisitions Concerning Astronomical Controversies and Novelties, 1614)*, Scheiner's pupil Johann Georg Locher offered an object lesson in how a useful theory could be parted from its problematic author. As his teacher had with Galileo's claim to the invention of the telescope, Locher questioned both the novelty and the priority of the Dane's ideas. Tycho, he claimed, had merely made minor amendments to Capella's antique system—an adaptation that was only partially successful. Although Clavius' eleven-sphere system was immediately outpaced by the phenomena it sought to save, each author had no doubt that, but for his death, the esteemed pedagogue and his confrère Magini would have more effectively incorporated Capellan theory into a coherent, Ptolemaic world-system (Galluzzi 2017, 79–83; Graney 2017).

In *Aristotelis loca mathematica* (*Aristotle's Mathematical Premises*, 1615), meanwhile, Biancani proved sympathetic to portions of Galilean and Tychonic theory concerning the shape and structure of the Moon, the superlunary position of comets, the fluidity of the heavens, and the motive forces of planets. Each of these positions duly featured in his textbook on the *Sphere*, written around the same time but published in 1620. Blackwell notes that Biancani's works fell afoul of Jesuit censorship, with Giovanni Camerota (1559–1644) advising that it did "not seem either proper or useful for the books of our members to contain the ideas of Galileo, especially when they are contrary to Aristotle." Part of the work was therefore deleted, with readers advised to turn to Galileo's own works if they absolutely must. Grienberger's report on his colleague's cosmography was even more pained. Here, the censor cited Bellarmine before advocating for "a greater degree of freedom of thought to be given to both mathematicians and philosophers on this matter, for the liquidity and corruptibility of the heavens are not absolutely contrary to theology or to philosophy, and even much less to mathematics" (Blackwell 1991, 150–52; Baldini 1984, 31–36). This plaintive admonition of his superiors contained a tacit acknowledgment of the dissolution of the spheres advocated for in the mid sixteenth century by Jean Pena (d. 1558), and the associated revival—in which Bellarmine was a participant—of the works of the Patristics, which saw biblical cosmology synthesized with Platonic and Stoic doctrines (Granada 2006, 129; Barker 2008).

The Capellan roots of the Tychonic world-system aided the humanist adoption of a paradigm that, although appearing new, nonetheless offered the security of classical knowledge as a bulwark against the twin threats of celestial change and revolutionary theory. What could not be saved, however, was Aristotelian physics. Gentle efforts in this direction had already been made by Clavius, who was on occasion happy to consider Aristotle an authority on historical rather than present-day astronomy (Lattis 1994, 80). Likewise, the conservative Parisian du Chevreul casually mentioned that "on the occasions when [Aristotle's] opinions are faulty, we should only embrace what he *ought* to have thought."[15] A trio of comets in 1618 further encouraged Jesuit astronomers to depart from the Stagyrite, at least on astronomical grounds. In *De tribus cometis anni* MDCXVII and *Libra astronomica* (*On the Three Comets of 1618* and *The Astronomical Balance*, both 1619), as well as lectures on the *Sphere*, Christoph Grienberger's successor at the Collegio

[14]Tycho later realized that the intersection of the solid Martian and solar spheres was disastrously incompatible with nature, necessitating the dissolution of this model's celestial orbs entirely. See Goulding 1995, 156–58 and Granada 2006. On Capellan theory, see Eastwood 2000.

[15]Ariew 2006, 107; Jacques du Chevreul, B. M. Cherbourg, MS 24, fols 334–35, quoted in Brockliss 1987, 372–73. My emphasis.

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Romano, Orazio Grassi (1583–1654), argued that cometary parallax demonstrated these to be super- rather than sub-lunary phenomena, confirming in the process his support of the fluid heavens (Ariew 1992). Although he had defended geocentrism at length in his vituperative polemic with Galileo, Scheiner's position on Aristotelian cosmology proved similarly flexible. Falsely painted as an intransigent scholastic by his opponent, Scheiner now promoted epistemic praxis in tandem with appropriate scriptural exegesis, his Rosa Ursina arguing for corruptible, fluid, and igneous heavens at the expense of the solid spheres. Scheiner's weaponry in this argument was an intriguing combination of sensory experience enhanced by projective instruments, mathematics, and scriptural authorities. In Michael John Gorman's (2007, 33–34) reading, *Rosa Ursina*'s frontispiece positioned "the projected image of the sun obtained by means of a telescope in a hierarchy of sources of reliable knowledge," in which sacred authority and reason produce clear images of sunspots. Likewise, the telescope represented an extension of the senses' clarity: by contrast, profane authority guided only via a "dim lantern" (ibid.).

Existing scholarship on Jesuit astronomy locates Biancani, Grassi, Scheiner, and their colleague Cristoforo Borri (1583–1632) in a vanguard of Tychonic or semi-Tychonic theoreticians, writing after Clavius' death and either side of Galileo's 1633 defenestration. The Catholic astronomer-clerics of this period diverged from their prior commitment to celestial incorruptibility and the wider Aristotelian–Ptolemaic framework by moving piecemeal towards the geoheliocentric world-system, whose inconsistencies represented a lesser evil than Galileo's heliocentrism. Fealty to the precepts of traditional astronomy was a religious requirement mandated in the 1616 condemnation of Copernicus. Discussion of the perfectibility of the heavens, on the other hand, allowed for variable interpretations without the threat of formal censure. Engagement with Ptolemaic, Copernican, and Tychonic systems thus continued on mathematical, metaphysical, and exegetic grounds, with authors affecting either studied neutrality or litotic irony in their presentations of various models. In this scenario, it was left to the student to read between the lines and decide precisely which conclusions (if not hypotheses) were inimical to Catholic teaching (Grant 2003, 128; Remmert 2008, 672 and 684; Remmert 2019, 294).

Thus, when the opportunity arose for Philip O'Sullivan Beare to make good on his promise to return to astronomical study, the foremost Catholic theorists of the day offered a range of options rather than the singular mode of thought previously assumed of monolithic Jesuit Aristotelianism (Schmitt 1973). The Ptolemaic tradition pertained in Clavius' comprehensive and popular commentaries on the *Sphere*. If this was by now somewhat outdated, a sympathetic reader could turn to the pedagogue's faithful follower du Chevreul, and his attempted syncretization of Aristotelian and Galilean cosmologies. Alternatively, those inclined towards the Tychonic geoheliocentric system found succour in Biancani's textbook, which refuted the Aristotelian world-system despite the Jesuit Order's initial censorship. By the late 1620s, well-heeled readers might even review the work of Scheiner, whose name had been made through intensive polemic against Galileo and, more recently, thanks to his expert work on sunspots. Importantly, the final books of the voluminous *Rosa Ursina* featured extensive documentary evidence from the Church Fathers and Bellarmine on the religious suitability of the fluid heavens (Scheiner 1626–30, 775–87). Crucially, each of these post-Clavian works also considered the Copernican (or "Pythagorean") system, offering cutting or more ambivalent critiques along the way.

The fragment's content: Reading Galileo through a Parisian lens

Although his primary source was Jacques du Chevreul's *Sphere*, Philip O'Sullivan Beare departed noticeably from the French schoolman's teaching. He eschewed Aristotelian-Ptolemaic, Galilean, and Copernican hypotheses on varying scriptural, physical, and philosophical grounds, all of which bore the stamp of Bellarminian cosmology. Such reading was in keeping with a scholastic disputational culture that encouraged students to defend precepts by refuting their heterodoxies. By necessity familiar with the use of literal exegesis and Church authorities in debates with

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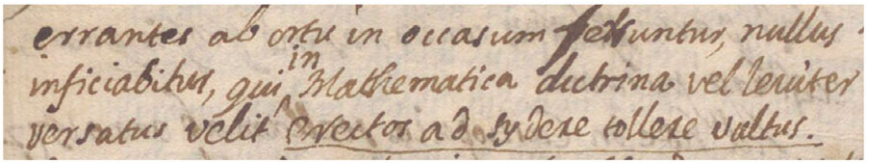

Figure 2. Examples of Philip O'Sullivan Beare's reading practices feature the underlining of commonplace quotations and arguments from literary and scriptural sources. Uppsala University Library, H248, fol. 358r.

Protestant opponents, Catholic students were increasingly encouraged to engage with the new astronomy as part of their philosophical and metaphysical education. Specifically referencing seventeenth-century Jesuit teaching, Renée Raphael (2015, 433; 2017, 184) has argued that these overlapping cultures may even have contributed to a sophisticated exchange of techniques, methods, and evidence between the Order's mathematicians, natural philosophers, and theologians before and after 1633. Commencing with a discussion of the apparent east-to-west diurnal motion of celestial bodies around the Earth, O'Sullivan Beare's opening lines suggest that the author sought to identify himself and his ideal readers as scholars familiar with such higher orders of learning. The diurnal movement of celestial bodies was, he glibly remarked, undeniable to "anyone even lightly versed in mathematical teaching," or to anyone "willing to lift their faces to the stars."[16]

A means to elevate humanity's standing above ground and a spur to contemplation of the heavens' majesty beyond, this classical *topos* was a variation on a theme dating back at least as far as Plato and transmitted thanks to its repetition by Aristotle, Cicero, Ovid, Marcus Manilius, and a great many others (Burton 2007, 24–26; Oosterhoff 2015, 15–17). The rhetorical practices of humanist education ensured the apothegm's praise of the benefit of astronomy to philosophy and theology continued, and its use helps to highlight the active reading taught within these pedagogical structures. As figure 2 illustrates, O'Sullivan Beare underlined direct quotations from literary and scriptural authorities throughout his short manuscript. Commencing his *Commentary* on the *Sphere*, Clavius had incorporated similar encouragement from "divine Plato" concerning the propaedeutic role mathematical astronomy afforded natural philosophy, before rounding off his celebration of the discipline's utility with a series of poetic vignettes cribbed from the *Metamorphoses* and the *Fasti* (Clavius 1612b, 5).[17] This was in keeping with the exemplar of Sacrobosco, who peppered his own work with excerpts and textual reports on the stars from Ovid, Lucan, and Virgil (Thorndike 1949, 87 and 91–95). The appearance of such lines undoubtedly appealed to the erudite Irish soldier, whose modes of exilic writing belonged to a dislocated Gaelic culture inclined to paint its scattered population as akin to beleaguered Trojans (Darwin 2021).

To refute the world-systems proposed by Ptolemy, Copernicus, Clavius, and Tycho, O'Sullivan Beare then presented a *petitio principii* that begged the underlying premise of all cosmological models. While care must be taken to recognize the incomplete nature of the manuscript, the commonplace opening of the fragment is less a celebration of astronomy than it is a critique familiar with the discipline's recent developments—a style familiar to Parisian students' reading of editions of the *Sphere* (Oosterhoff 2015, 18). The shape of the Irish author's argument soon became apparent. Only those lacking sense or reason would argue against daily celestial movements. Moreover, respected classical authorities had taught of the perfectibility of the heavens and their constituent bodies, with ever more precise observations appearing through subsequent generations. Yet, greater knowledge had brought only a multiplication of models, and

[16]O'Sullivan Beare 1626–30, fol. 358r. "[E]rrantes ab ortu in occasum feruntur, nullus inficiabitur, qui in Mathematica doctrina vel leviter versatus velit erectos ad sydere tollere vultus. Hic diurnus motus vocatur."

[17]See also Clavius' praise of Plato in the *Prolegomena* to his commentary on Euclid's *Elements* (Clavius' 1612a, 3 and 5–6). I am grateful to Angela Axworthy for this reference.

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with those only further confusion. These processes threatened to culminate with the rejection of biblical evidence and its authoritative Patristic commentary—a postlapsarian error that echoed the mistakes of Eden and Babel. Personally familiar with expulsion from naïve paradise and the attendant processes of linguistic erasure that followed, O'Sullivan Beare wished *Zoilomastix* to present a near-total recovery of Catholic natural philosophy. How, then, could epistemic observation be made to fit with the literal interpretation of scripture?

The strategy upon which the soldier-historian settled was simple, and can be linked to the Thomist, scholastic *dispositio* witnessed in his more aggressively polemical works. His *narratio* first dispassionately paraphrased du Chevreul's treatment of existing cosmological theory, swiftly summarizing developments across centuries of orthodox celestial mechanics with reference to the motions of the planets and the fixed stars. In contrast to the movement of the planets, "the most distinguished astronomers" had previously "asserted that the fixed stars ... follow the opposite path (to use the correct term) in travelling from west to east." Such contrary motion was the precession of the equinoxes. Reconciling planetary data gathered across millennia with contraries present in Aristotelian cosmology had required theorists to first conceive of the *primum mobile* as the ninth sphere beyond the firmament of the fixed stars, with precessional movement a uniform eastward rotation of the eighth sphere respective to the ninth. This explanation itself failed to explain subsequent observations. Indirectly referencing Thābit's purported influence upon medieval and early modern adherents of the ten-sphere system, O'Sullivan Beare (1626–30, fol. 358r) noted that a further, non-uniform motion had later been detected:

> The most renowned astronomers have observed that the fixed stars move in a contrary motion, as it is properly called, from west to east. In fact, they clearly find a third [motion] that also shakes or wavers between north and south (so they call this motion "trepidation").[18]

In the main, sixteenth-century natural philosophers and *mathematici* had adopted Peurbach and Regiomontanus's emendation of Alfonsine teaching. They propounded that the *primum mobile*, now promoted to a tenth celestial sphere, generated the east-to-west motion of all lower planetary spheres. The ninth sphere was responsible for gradual, precessional west-to-east motion, and carried the fixed stars, while the eighth possessed its own, trepidational movement. This position was maintained in sources such as the authoritative Jesuit *Conimbricenses* (*Coimbra Course*, c. 1592–1606), but its acceptance was by no means total (Grant 1994, 315–18). Although Clavius had celebrated the ten-sphere system and its successful transmission, his important work on calendar reform, his reading of *On the Revolutions of the Heavenly Spheres* (1543), and his use of Erasmus Rheinhold's (1511–53) Copernican *Prutenic Tables (1551)* convinced him that trepidational motion was unsustainable. The movement conflicted with astronomical observation, with the measurement of the maximum solar declination, and with the calculation of the length of the year. The observed phenomena of trepidation and libration *could* be justified, however, if one accepted the mobility of the Earth. Copernicus had made this one of his theoretical tenets, and attributing to the planet a trio of motions—daily rotation, annual revolution, and an annual axial tilt—allowed the Polish astronomer to explain the apparent retrograde motion of other celestial bodies. Unable to follow Copernicus' lead, Clavius instead added a further heaven, while his colleague Magini's engagement with heliocentric data resulted in the phenomena transferred to stellar rather than terrestrial motion (Lattis 1994, 160–73).

Accordingly, Copernicus, Clavius, and Magini were those O'Sullivan Beare (1626–30, fol. 358r) referred to as among a set of "the most recent astronomers" who had

[18]"Inerrantes vero contrario motu (qui proprius dicitur) ab occasu in ortum ire, Astrologi clarissimi assuervaverunt [*sic*]. Quin et tertio etiam inter septentrionem, et austrum cieri, vel trepidare (unde motus trepidationis nomen ediderunt) aliis ... minime obscure iudicarunt." I am grateful to a reviewer for clarification on this translation.

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> ascribed to these bodies a fourth reciprocal movement, although it is incomplete, whereby they appear to travel from the east in a westwards direction, and then in the reverse direction. Some scientists know this motion as "libratio."[19]

These efforts were rather skeptically appraised by O'Sullivan Beare due to their authors' accommodation of portions of the heliocentric hypothesis within the Aristotelian-Ptolemaic world-system, and the movements required to reconcile this assembly of contraries met with his ironic detachment. The soldier-historian gifted classical astronomers superlatives, while several of their medieval counterparts were deprecated as "by no means the least in their field." A third group of contemporary theorists then joined their more illustrious predecessors in adding ever more movements to simple bodies to save the phenomena. In the fourth and sixth chapters of his *Sphere* ("On the Stars" and "On the Number of the Heavens"), du Chevreul defended these movements and the efforts of Clavius and Magini. But rather than following the French schoolman in developing a novel cosmology in which the crystalline spheres survived by rearranging the heavens to match Galileo's recent observations, O'Sullivan Beare instead recast the mounting difficulties theorists past and present had faced by arguing that their attempts to preserve all or part of the traditional world-system were evidence that the entire edifice should be deconstructed (fig. 3).[20]

To do so, O'Sullivan Beare first presented the traditional perspective. The seven observable planets

> may be observed to rise, set and stand in an easterly direction around the position of one or another of the fixed stars, and for this reason the most ancient interpreters of the heavens, the Egyptians, Chaldeans, and Greeks, concluded that they are traveling from west to east in an oblique path.[21]

Such observations had in part occasioned the most problematic astronomical work of the past century. Despite the paradigm shift his theory eventually encouraged, Nicolaus Copernicus had naturally adopted Peurbach's theorics as the foundation of his own work. Prior to asserting that the Earth orbits the Sun, Copernicus' unpublished manuscript *Commentariolus* (*Little Commentary*, 1514) offered an introductory summary of orthodox cosmology that assumed the reader's familiarity with eccentric and epicyclic spheres, axial inclinations, motions, and the precession of the fixed stars (Swerdlow 1973, 424–25). Antique astronomers' models were created to illustrate "the apparent motion of the planets by the principle of regularity," and to avoid the absurdity that a perfect sphere should possess non-uniform motion. Hence, "by connecting and combining regular motions in various ways," theorists had discovered that a heavenly body could be made to appear almost anywhere they deemed appropriate. The apparent rising and setting of the heavens stymied Callipus' and Eudoxus' attempted to resolve these revolutions using concentric spheres, and subsequent astronomers accordingly approved of Ptolemy's model and its necessary workarounds. Copernicus' short work intended to resolve this imperfect compromise once and for all by providing a "more reasonable arrangement of circles . . . in which everything would move uniformly" (Rosen 1937, 124, 125).

For Copernicus, the circularity or compound circularity of these motions was akin to a natural law, expounded in both the *Little Commentary* and *On the Revolutions of the Heavenly Spheres*

[19]"Neque defuereunt ex recentissimis Astrologis, qui eisdem ad scripserunt quartium reciprocum, etsi imperfectum, quo ab ortu occasum versus, et contra veni videantur. Hic motus libratio non nullis . . . appellatur."

[20]O'Sullivan Beare's summary displays an extremely high degree of similarity to portions of each of these chapters. See particularly du Chevreul (1623, 66–90, 136–58).

[21]O'Sullivan Beare 1626–30, fol. 358r. "In super Saturnum, Jovem, Martem, Sole(m), Venerem, Mercurium, Lunam, septem notissimos errantes, quia ortum versus sub alio atque alio inerrantium stellarum situ. Oriri occidere, et cetere, deprehenduntur ab occasu in ortum oblique meare decreverunt Antiquissi(mi) coeli interpretes, Aegyptii, Chaldaei, Graeci."

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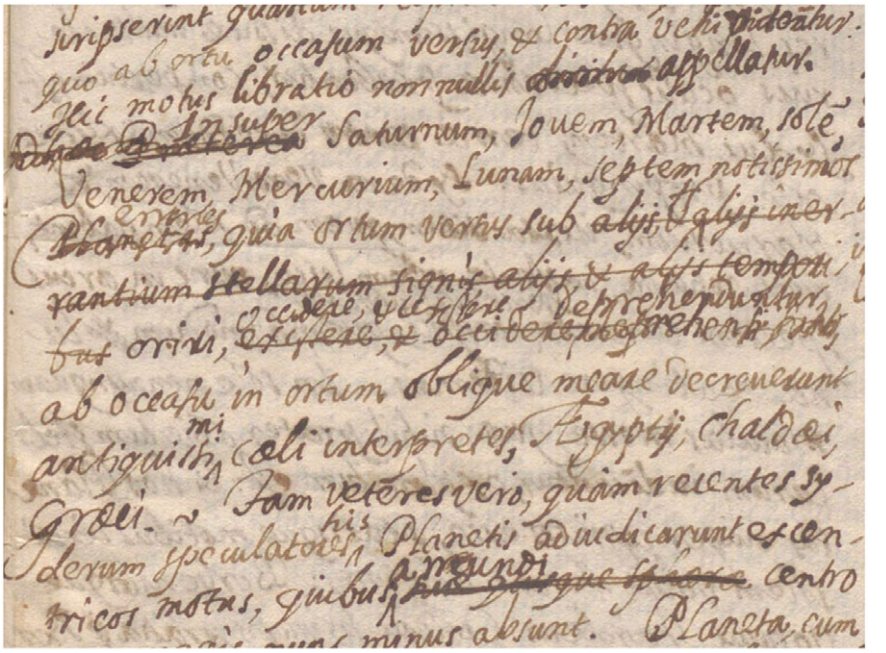

Figure 3. O'Sullivan Beare's paraphrase of Jacques du Chevreul's *Sphere*, with excerpts struck through and rewritten. Uppsala University Library, H248, fol. 358r.

three decades later. The Polish astronomer mandated that planetary absides—the two points of either maximal or minimal distance to the body around which a planet orbits elliptically—offered "true testimony" that made manifest the movement of the Earth, a crucial point when differentiating the "empirically equivalent astronomical theories" of geocentrism and heliocentrism (Graßhoff 2008, 143–44). In contrast to Ptolemaic geocentrism and Copernican heliocentrism, for O'Sullivan Beare the demands made by eccentric planetary spheres and the maneuvres required to reconcile them with the principle of uniform motion were beyond credibility. Before reaching this point, however, he described the planetary absides succinctly, inviting witness of the accepted eccentric motion of planets and their elongated orbits:

> Yet again both ancient and modern models of the stars have attributed eccentric motions to these planets, whereby they are now more distant from, and now closer to, the center of the universe. When a planet is at its greatest distance from this center, it is said to be at its Ogee, or Apogee, or Apse, that is to say, at its furthest point. When it is located closest to it, it is thought to be positioned away from the area of the Ogee at what is known as either the Hypogee or the foot of the Apse, that is to say, in the part closest to the center.[22]

Clearly, the recapitulation provided by the Irish soldier-author up to this point made no claim to novelty. His *narratio* instead outlined a historiography common to astronomical treatises authored by Copernicus, Clavius, Tycho, and others, written with the intent of preserving or, more frequently, overthrowing the Ptolemaic system—a polemical tactic that Johannes Kepler

[22]O'Sullivan Beare 1626–30, fol. 358r. "Tam veteres vero, quam recentes syderum speculationes his Planetis adiudicarunt excentricos motus, quibus a mundi centro nunc magis, nunc minus absunt. Planeta, cum ab hoc centro maxime distat, hunc in Auge, vel Apogeo, vel summa abside, idest maxime longinquo vertice dicitur esse. Cum a centro ab ille minimum dissitus est, hunc e regione Augis vel in Hypogeo, vel ima abside idest in parte centro maxime propinquae existere putatur." I am grateful to a reviewer for clarification on this translation.

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(1571–1630), for example, had employed to greater ends at the turn of the seventeenth century (Eastwood 1982). While these figures went on to provide the mathematical and physical rationales underpinning their hypotheses, O'Sullivan Beare was instead content to accept their reports to advance his own goals. His astronomical practice here was comparable to *Zoilomastix*'s Plinian natural history—namely, a combination of materials excerpted from named, if traditional, authorities, and the impersonal, passive reporting of more novel and speculative information. Continuing to build his argument through accepted observations, the author recalled the recent trio of "new stars": Tycho's nova, "a star in Cassiopeia [which] became visible to observers for the first time from the year 1572 to 1574," and novae in Cygnus (1600) and Serpentarius (1604), the latter of which had inspired Kepler's *De stella nova* (*On the New Star*, 1606). Adopting an anecdotal tone witnessed in Pliny and his commentators, O'Sullivan Beare (1626–30, fol. 358v) mentioned in passing that these were wonders of nature, the common discourse being that the entities "had on no previous occasion been observed or spotted appeared in the sky."[23]

Such observations offered the opportunity to relate destabilizing testimonies aided by a recent invention. Drafting a letter to Leonardo Donato, doge of Venice, in August 1609, Galileo presented the high-powered telescope as a marvel capable of "discovering the ships of the enemy two hours before they can be seen with natural vision," its lenses able to report "the number and quality of the ships and to judge their strength and be ready to chase them, or fight them, or flee from them" (Galilei 1609). The Pisan astronomer withheld his sophisticated version of the device from his fellow astronomers in search of social credit, even as he encouraged this community to accept its role in his most recent findings. Given that early versions of the telescope had been available to rich patrons from 1608, it was in Galileo's interest to ensure that nobles and the clergy appreciated his technological advancements—and their value to military exercises (Biagioli 2006, 82–85, 157–58). More ordinary telescopes soon made their way onto ships, and O'Sullivan Beare's knowledge of the power of these "long-vision devices . . . optical instruments, which allow distant objects, situated a very long way away, to be seen more clearly with the eyes"—may have been gleaned from his time in the Spanish navy.[24] Iberian colonialists used rudimentary looking-glasses in battles at sea in 1614, and there exist first-person reports of Dutch, Spanish, and English sailors reconnoitering enemy fleets and camps with the instrument that were written between 1619 and 1624 (Sluiter 1997). The soldier-historian's use of such a tool may have contributed to his awareness and acceptance of contemporary astronomical observations—a supposition offering support to Feldhay's entangled processes of state-sponsored knowledge-making between the prince's court and the soldier's camp—or officer's ship.

Of course, these telescopic observations also took their place in the more figurative conflict zones created in the aftermath of Galileo's *Sidereus Nuncius* (*The Starry Messenger*, 1610). Continuing his report on the device, O'Sullivan Beare's précis was again of noticeable similarity to his source material, albeit to differing ends. Aping du Chevreul's summary yet shunning his overall argument, the soldier-historian continued by identifying for his reader the names and positions of additional celestial novelties. Hence the Irish author reported Jean Tarde's opinion that recently observed sunspots "are thought to be nothing other than intervening heavenly bodies . . . recently been recognized as planets, which travel with uniform movements round the sun." Tarde dubbed these "Bourbon" "in order to gain favour with the Prince of Condé, who was born of [that] blood," likely in imitation of "the mathematician Galileo," whose famous (if partially incorrect) grouping together of Jovian and Saturnian satellites was completed "under the auspices of the Dukes of

[23]"Ad hoc in Cassiopoeia stellam ab anno 1572 usque ad 1574 unquam intuenitbus aspectabilem primum exfutisse [*sic*], inde vero abiisse, memoriae proditum est. Alias duas antea minime notatas, aut animadversas in caelo apparuisse, alteram anno 1600, alteram 1604 fertur."

[24]O'Sullivan Beare 1626–30, fol. 358v. "Jam vero Teliscopiis, vel Longispiciis conspiciliis, . . . instrumentis exactis, quibus res longinquae, longissimeque dissitae multo clarius oculis spectandae praebentur . . . ."

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Tuscany."[25] Just as the Parisian lecturer had, O'Sullivan Beare (1626–30, fol. 358v) remarked that the present-day use of the telescope helped confirm "that, at times, the planet Mars is closer to the Earth than the Sun," that Venus and Mercury orbit the Dun, and that both of these inferior planets each present phases "in accordance with the position they have facing the Sun . . . now with a round shape, as the Sun's light fills their circles, but now curved in a manner resembling a bow, with part of the light removed, in the same way as we see happening to the Moon."[26]

Acknowledging the device and its discoveries did not, however, mean acceptance of Galileo or his theories. As Roger Ariew has detailed, du Chevreul instead argued that the orbits of Venus and Mercury marked an important victory for epistemic observation. The telescopic findings of "neoteric" theorists settled a long running disagreement between Plato, Aristotle, Ptolemy, and Regiomontanus by "locating" the center of Venus' and Mercury's orbs as the Sun, about which they might be found above, below, and next to. Any alternative mechanism would, du Chevreul postulated, see the orbs interpenetrate each other, causing an impossible vacuum (du Chevreul 1623, 154–55; Ariew 2006, 104–5). The schoolman then attempted to use this argument against Tycho, who attempts to overcome a similar issue regarding the orbit of Mars had resulted in his turn toward the fluid heavens. Despite his acceptance that Copernicus' and Galileo's evidence contradicted Aristotle, du Chevreul (1623, 72) was unable to countenance this position, and it is here where the Parisian lecturer and his Irish reader depart most visibly. du Chevreul adhered rather noncommittally to the standard Aristotelian view that comets were sublunary. Impressed that Tycho's (incorrect) prediction concerning the return of the comet of 1577 appeared to have been borne out by the appearance of another comet in September 1618, O'Sullivan Beare however ascribed to the opposite position. In his retelling, the fiery messenger journeyed first "in orbit around the Sun above the Moon and below Mercury," and then forty-one years later "from the east towards the north at an altitude higher than the Moon."[27]

The introduction of this predictive evidence functioned as a gateway to O'Sullivan Beare's elevated *conclusio*, the soldier-historian rhetorically begging would-be opponents "what need is there of further examples?" Any potential response was drowned out in a thudding, recapitulative *enumeratio* employed at length throughout *Zoilomastix*. The author's copious examples boiled down to "these varied and contrary movements of heavenly bodies, these diverse appearances of heavenly bodies, this new appearance and disappearance of heavenly bodies," all of which were "at odds with the notion of the solidity of the starry heavens and its insuperable strength."[28] The major conclusions offered by du Chevreul must therefore be deemed false:

> Such a structure of the heavens, invented by the most ancient Egyptian, Chaldaean, and Greek astrologers, and enlarged by Timochares, Hipparchus, Ptolemy, King Alfonso, and the most recent writers, must now be rejected. The plan of the heavens made up and based on these observations of the heavens by the Pythagoreans and Copernicus is overturned.[29]

[25]O'Sullivan Beare 1626–30, fol. 358v. "In sole nonnunquam maculas in esse, quae nihil praeter obiectum stellarum iudicantur, exploratum est: et hos Planetas nuper cognitos esse, statisque motibus circu[m] Solem volui ferunt scriptores: Borboniusque vocavit Tardeus Condaei principis gratia Borboniorum sanguine orti . . . . Planetas duos circum Saturnum nomine Saturnios satellites: quatuor circum Jovem aqi, observatum est. Hos Mediceos Hetruriae Ducum auspiciis Galilaeus Mathematicus nominavit." A more detailed report, albeit with exceedingly similar language, features in du Chevreul 1623, 80–85.

[26]"Compertum est sydus, Martem, terrae interdum existere sole propinquius: sydera vero, Venerum, et Mercurium, iuxta situm, quem ad solem habent, nunc rotunda, implente orbem luce, nunc in arcus speciem curvata (perte suas subducto) conspici, quemadmodum lunae contingere videmus." Again, this bears high similarity to du Chevreul 1623, 86, 153.

[27]O'Sullivan Beare 1626–30, fol. 359r. "Cometam, qui anno 1577 spectantium oculis obversabatur, supra Luneum, infra Mercurium, circum solem verti solitum esse, Tycho Braheus est author. Is etiam, qui anno 1618, mense septembri extitit . . . Luna celsior ab oriente in Septentrionem tendere iudicatus est."

[28]O'Sullivan Beare 1626–30, fol. 359r. "Quid pluribus opus? Hi stellarum variis, contrariis motus, Hi stellarum diverti aspectus, hic stellarum novus accessus, et recessus nequtunt cum stelliferi coeli Duritia, indomitoque vigore consistere."

[29]O'Sullivan Beare 1626–30, fol. 359r. "His observationibus ista caelorum fabrica ab antiquissimis Astrologis Aegyptiis, Chaldaeis, Graeci inuenta,et a Timochare, Hipparcho, Ptolomeo, rege Alphonso, recentissimusque scriptoribus aucta concidat, est necesse. His observationibus caelorum collocatio a Pythagoreis, et Copernico ficta funditq[ue] evertitur."

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Ever-present in O'Sullivan Beare's printed works, the unmistakably polemical tone employed here eschewed du Chevreul's more careful analysis as well as the frequent *monitum* headings that peppered the French professor's introductions of unorthodox and heretical positions. Admitting that "my own opinion rests on these observations"—that is, his contradiction of the astronomical observations of the aforementioned theorists, gathered across millennia—the author concluded, as Bellarmine had, "that the stars cross the heavens each with its own motion."[30]

The argument's denouement stridently made its rejection of Ptolemaic-Aristotelian, Clavian astronomy crystal clear:

> As a result, let us agree that the fixed stars do not trace out perfect circles, but range the heavens in spirals, and gather together now more slowly, now more quickly, and for that reason are incorrectly believed to move with diverse motions: some shared with others and some individual; now in a restless haste, and now with a leveling motion. As a further result it is not surprising that the planets, being below the varying locations of the fixed stars, are at times quite distant from the Earth, and orbit round one another, and as a yet further result comets, being far removed, are for the most part hidden from us, but at times come closer and are visible: for they are all wandering in the flowing air.[31]

Evidently, this cosmology was neither Tychonic nor semi-Tychonic, as alternative proposals written by Catholic theorists between 1611 and 1633 were. Neither was it Pisan, nor Parisian. While du Chevreul's well-received *Sphere* offered a genuine attempt at reconciling Aristotelian and Galilean theories despite their obvious fissures, the Irish author's universe was in no way heliocentric, and his acceptance of Galileo's achievements indicated support only for the use of the telescope to resolve historical errors. Rather, the litany of scriptural authorities with which the fragment finishes indicates Philip O'Sullivan Beare's support of Bellarmine's idiosyncratic, biblically adherent, and mathematically specious world-system, as transmitted in his lectures of the early 1570s and in his 1618 correspondence with Galileo's supporter Federico Angelo Cesi (1585–1630)—the latter of which was reprinted in Scheiner's *Rosa Ursina*.

In keeping with the theologian's Thomist metaphysics, O'Sullivan Beare (and, it should be noted, du Chevreul) interpreted Scripture via the Church Fathers. Just as the first extant page of the soldier-historian's fragment had commenced with astronomical authorities in the margins, its final leaf concluded by citing the Patristic triumvirate Basil of Caesarea, John Chrysostom, and John Damascene, and their commentaries on verses from the books of Genesis, Exodus, Joshua, Job, Ecclesiastes, Ecclesiasticus, Habakkuk, and Matthew (fig. 4). The correct hermeneutic interpretation of the heavens and of celestial kinematics was for Bellarmine and for legions of post-Tridentine Christian readers a matter of literal faith—a matter Bellarmine imposed upon the Copernican Carmelite, Paolo Foscarini (c.1565–1616), in 1615:

> the Council [of Trent] has prohibited the interpretation of Scripture contrary to the common agreement of the Holy Fathers. And if Your Reverence will read not only the Holy Fathers but also the modern commentators on Genesis, the Psalms, Ecclesiastes, and Joshua, you will find that they all agree on the literal interpretation that the sun is in the heavens and rotates around the earth with a great speed, and that the earth is very far from the heavens and stands immobile at the center of the world. (Blackwell 1991, 265–67, 266)

[30]O'Sullivan Beare 1626–30, fol. 359r. "His observationibus nostra sententia fulcitur. Quippe nos asserimus per coelum meabiles astra, suo quodque motu, penetrare."

[31]O'Sullivan Beare 1626–30, fol. 359r. "Hinc inerrantes stellae ut perfectos circulos non describant, sed spiras lustrent, . . . et nunc lentius nunc velocius glomerentur, ideo diversis motibus, alio communi, alio proprio tum trepidatione, tum libratione motavi falso creduntur: hinc errones sub alio, et alio inerrantium astrorum situ videli[cet], atenra nonnunquam longius ab esse, alios circum alios duci . . . non est mirum: hinc quoque nobis cometae plerumque procul remote occultantur; aliquando propius ad moti . . . ostenduntur etenim omnes in aere fluido errant."

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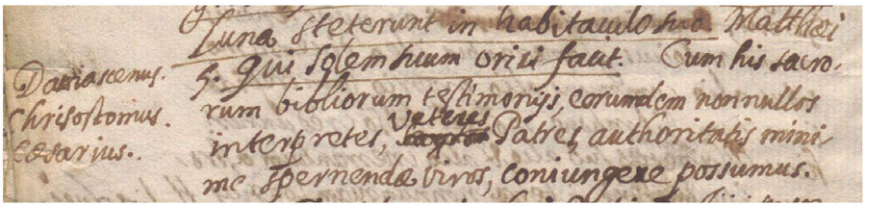

Figure 4. Philip O'Sullivan Beare's indexing of the Patristic authorities "Damascenus" (John Damascene), "Chrisostomus" (John Chrysostom), and "Caesarius" (Basil of Caesarea, or Basil the Great), seen in the left margin, with scriptural examples underlined in the body text. Uppsala University Library, H248, fol. 359v.

The influential theologian concluded his letter with a sympathetic discussion of the plausibility of the heliocentric hypothesis, albeit if sufficiently demonstrated. Nevertheless, his fidelity to the *sensus literalis* ensured his acceptance of biblical and Patristic authority and, as a corollary, the geocentric interpretation of the heavens. As Bellarmine warned Foscarini, adopting this position was religiously as well as politically advisable: "Consider now, with your sense of prudence, whether the Church can tolerate giving Scripture a meaning contrary to the Holy Fathers and to all the Greek and Latin commentators" (Blackwell 1991, 265–67, 266). It is unsurprising that the militantly Catholic O'Sullivan Beare would conform to some variety of literal interpretation and he duly advocated for a cosmology "which is asserted in the divine writings of [Church] authority, which teach that the stars and never the heavens move."[32] Examples from the books of Genesis, Isaiah, and Job confirmed that the Sun rose and set upon the Earth; that it could be moved by heavenly power to the finest of degrees; and that, when commanded, the passage of bodies other than the Earth was paused according to specific events or individuals respectively. Particularly pertinent to the dislocated Gaelic Irish nobleman was the example recounted in Joshua 10.12–15, where true believers avenged themselves on deceitful, exogenous warmongers as the Sun and Moon stood still.[33] Conclusive evidence of Bellarmine's heavenly structure had already been placed before man, and vainglorious attempts to restructure the form of the universe were, therefore, yet another example of heterodox attacks upon the authority of the Catholic Church and the truth of God's word. As the Book of Job demonstrated, the deity was liable to respond incandescently, excoriating earthly examiners for daring to behold the reflective empyrean as He did.[34]

A Gaelic interpretation of Mosaic philosophy?

But why was this astronomical fragment appended to O'Sullivan Beare's natural history—that is, beyond the texts' chronological proximity? Early modern Catholic and Protestant natural philosophers alike found in the Bible, its Patristic commentaries, and hexameral literature a physics upon which a pious non-Aristotelian philosophy might be grounded. This "Mosaic" physics prioritized the unity of knowledge, independent of scholastic or neoteric methods. It promised a true reconciliation of philosophy and theology through the literal reading of the Bible as *the* authoritative text presenting natural and historical truths (Blair 2000, 47–52). Furthermore, the multi-contextual humanism that underpinned this "hexameral idiom" offered proponents a sacralized philosophy that aided the transmission of novel ideas. In one important example, it

[32]O'Sullivan Beare 1626–30, fol. 359v. "Hoc etiam divinarum litterarum authoritate confirmatur, quae saepe sydus, nunquam caelum moveri docent."

[33]O'Sullivan Beare 1626–30, fol. 359v. "Josue 10. Sol contra Gabaon ne movearis, et luna contra valleum Aialon; steteruntque Sol et Luna. Item. Stetit itaque sol in medio coeli, et non festinavit occumbere in spatio unius diei."

[34]O'Sullivan Beare 1626–30, fol. 359v. "Libri Job c. 37. '[T]u forsitan cum eo fabricates es caelos? Qui solidissimi, quasi aere fusi, sunt ...."

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heralded the inclusion of Stoic theories in Christian cosmology (Magruder 2009, 207–8). Prior to Justus Lipsius' (1547–1606) promotion of Stoic political beliefs, mathematical astronomers working before Tycho—most particularly, Jean Pena and Christoph Rothmann (c. 1550–1600?)—employed conceptions on the shape and substance of the heavens taken from Cicero's *On the Nature of the Gods* and Pliny's *Natural History*, where benevolent deities designed for man's benefit corruptible, spherical, and fluid heavens whose celestial bodies encircled the Earth (Barker 2008, 267–68).

Adapting Pena's optical arguments to explain the superlunary location of comets, Rothmann argued against the Aristotelian world-system on mathematical, physical, and philosophical grounds, proposing that the universe was composed of fire and air (i.e., the Stoic *pnuema*) rather than crystalline spheres. Pena's links to the "heretical" Peter Ramus complicated acceptance of his theories amongst the scholarly Catholic elite of mid sixteenth-century Paris. But his ideas found favour with Rothmann, a court astronomer of the Landgrave of Hesse, Wilhelm IV (1532–92) and predecessor of Tycho—the latter two of whom were mentioned in the Irish soldier-historian's introductory list of authorities. As we have seen, acceptance of Tychonic theory and its correlated rejection of the Ptolemaic-Aristotelian system underwent detailed processes of censure and denial. The assumption of new ideas had, however, an innately literary element. Thanks to his centrality in the Jesuit *trivium*, pedagogues and students were intimately familiar with Cicero, and treatises presenting the Aristotelian, Tychonic, and Copernican or Pythagorean system to some degree mimicked the equivocal treatment the Roman rhetor had offered Epicurean, Stoic, and Skeptic cosmologies in *On the Nature of the Gods*. Attention to the antique sources of geoheliocentric systems thereby enabled authors' and, importantly, readers' engagement with discourses where boundaries between theories gradually became fluid.

Between 1621 and 1629, O'Sullivan Beare's attempts to blend political, natural, and sacred histories drew upon several French and Spanish sources. *Zoilomastix* took inspiration from editions of Pliny's *Natural History*, most particularly Jacques Daléchamps' (1513–88) extensive 1587 commentary and Jerónimo Gómez de la Huerta's (1573–1643) vernacular translation, published first as individual books (1599–1603) and then as a complete edition (1624–29). The author added to these materials personal recollections of Irish flora, fauna, and *mirabilia*, notes on Gaelic nomenclature, and attacks against various English conquests. As we have seen, his astronomy relied upon Jacques du Chevreul's commentary on the *Sphere*, a textbook common to Parisian students of metaphysical theology, significant numbers of whom were of Irish stock. Countrymen moving between France and Spain may have provided the author with these works, as well as treatises on Aristotelian meteorology (1613) and Sacroboscan cosmography (1623) authored by the Irishmen John Geraldine and Bernardus Morisanus respectively. In his later *Patritiana decas*, the soldier-historian demonstrated his awareness of the chronological and astronomical philology of the Leiden-based, French Calvinist Joseph Justus Scaliger (1540–1609), to whose work he was likely introduced by his friend and fellow soldier-intellectual, the Spanish nobleman Don Francisco Bravo de Acuña (fl. 1629) (O'Sullivan Beare 1629, fol. 125v). Acuña's validation of the commentaries of the Church Fathers took him to the royal libraries of Paris and El Escorial prior to his return to active duty (Jaski 2021, 334–35). Taken in the round, then, the Irishman's reading program allied non-Aristotelian physics with contiguous forms of *historia* to encompass an imperial and indeed empyreal frame.

Yoked to natural theology, natural history was long perceived as a literary mode through which one might ascend from the world toward God, and attempts to overhaul the historiographic method nevertheless retained this view. In one such example, Jean Bodin's tripartite definition of history's *genera* as human, natural, and divine was constructed to convince readers to turn away from the unrest and upheaval of the present moment and, through contemplation of nature, to turn instead toward eternity (Ogilvie 2005, 91–92). As we have seen, O'Sullivan Beare's first-hand experience of the traumatic output of heterodox English Protestant policies motivated his later active reading of ethical, natural, and cosmological discourses. To justify writing *Zoilomastix* at all,

the author referenced Seneca's *Moral Letters to Lucilius*, where the Stoic advised that every earthly empire fell, and every monument crumbled (O'Sullivan 2009, 31; Seneca 1920). Defending geocentrism in the same textual space as Gaelic Ireland's natural and cultural environments, he followed Pliny by emphasizing the chrono-spatial relationship of everything to the center of the universe (i.e., the Earth) and of the proximity of everything terrestrial to the imperial center of Earth (i.e., Rome). The preservation of the Roman empire and its dominion over nature was part of Pliny's writing of "a multi-dimensional nature of space, and a vision of the past which can become fused with the present and future through its interaction with the spatial dimension" (Beagon 2000, 20; Murphy 2004). This relationship incorporated *pneuma* in terrestrial and celestial wonders alike, and was one O'Sullivan Beare found intoxicating. From his distant perspective, attacks on embattled Gaelic Irish nature and culture repeated metonymically efforts to displace Rome and, by extension, the Earth, from its central position. As they had for Pliny, the wondrous properties of life-giving rivers, plants, animals, and stones detailed in *Zoilomastix* and its astronomical fragment animated demonstrations of God's beneficence as extended to man.

Though the epistemic genres of natural history and the "new" astronomy were somewhat orthogonal, natural historians and theologians had similarly begun to incorporate Galileo's recent discoveries into their reading of *On the Nature of the Gods* as early as 1613 (Ogilvie 2005, 94), and these multivocal contributions encouraged O'Sullivan Beare to join in the wider cosmological debate, returning the Earth to its privileged position—not as a nested sphere or a loosened wanderer, but at rest at the heart of a fluid, Mosaic heaven. Eschewing the pedagogical goals of many pious seventeenth-century Mosaic philosophers, however, O'Sullivan Beare saw his polemical use of epistemic *historia* as a tool to settle conflicts in political and natural theologies (Blair 2000, 54). Similar strands of thought have been identified at El Escorial at the end of the sixteenth century, transmitted via Philip II's (1527–98) personal physician, Fray Luis de Léon (1527–91), and more pertinently, through the "disquieted" natural philosophy of Benito Arias Montano (1527–98) (Portuondo 2019). A correspondent of Lipsius and familiar to Leuven contemporaries of Bellarmine, Montano belonged to a loose network of Catholic philosophers whose beliefs were linked by hermeneutic exegesis, the literal role of Scripture in natural inquiry, and a quasi-Stoic conception of the universe. It is impossible to claim that O'Sullivan Beare was an important intellectual inheritor of this Iberian tradition, or even a meaningful contributor to its seventeenth-century continuation. Rather, his limited attempts reflect an exiled Irish émigré's immersion in Hiberno-Spanish theology, and his subsequent attempts to participate in the *mentalité* of the Hapsburg court to advance his political aims.

This political context may help to explain why *Zoilomastix* remained incomplete. The mature O'Sullivan Beare was expelled from the Irish College of St. James after contesting its takeover by the Society of Jesus, and the exile's adoption of Bellarminian rather than explicitly Jesuit cosmology may have been motivated by his subsequent antipathy toward the Order. It is possible that such factors prevented the troublesome lay reader from publishing his exegetic cosmology thereafter. Even if O'Sullivan Beare himself took the decision to pause work on *Zoilomastix*, however, evidence from his later works suggests that its arguments were by no means "abandoned." In paratextual letters prefacing *Patritiana decas* (1629) the Lusitanian nobleman Don Jorge Mendoza Afranca (fl. 1621–29) lauded the fragment as part of a forthcoming natural history.[35] To repudiate depictions of the Irish as barbarians, unworthy of physical or cultural protection, Afranca echoed O'Sullivan Beare's rejection of the "invidious, grand lies" of Gerald of Wales and the "stupidity" of Richard Stanihurst.[36] Lionizing his friend's intellectual bravery, the Lusitanian knight reported that O'Sullivan Beare was continuing to work on a warlike treatise that

[35]Afranca was introduced as "Domini Georgii Mendoaze Afrancae Lusitani clarissimo genere nati, e sacra Christii religione militari equitis in authoris laudem Elegia."

[36]O'Sullivan Beare 1629, x–xi, l.31–32. "Invidiae partus, mendacia magna Gyraldi/Rejicit, et stolidus quae Stanihurstus habet". For O'Sullivan Beare's use of similar terms, see O'Sullivan (2009, 31–33).

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took to task heretical cosmologies in defence of Catholic orthodoxy.[37] Belonging to a performative genre of military life-writing prominent in Spanish circles, such letters were used in petitions to the royal court and portrayed combatants' religious and supra-national fidelity, their bookish learning, and their military exploits as evidence of "debts of honour" repayable by state patronage (Harden 2020). On a more personal level, the epistles exchanged between the soldier-authors echo O'Sullivan Beare's communications with Synott and Trant, and evince his long-term interest in using astronomy in support of his historiographical practice. Though *Zoilomastix* lay in authorial limbo at the time of *Patritiana decas*' publication, this continuing interest is visible in the hagiography's penultimate chapter—a flight of cosmogonic poesis reframing St. Patrick's journey in mystic, mythemic, and meta-mathematical analogies.

While this convocation with the heavens deserves detailed study elsewhere, it may briefly be placed alongside the astronomical fragment in a longer tradition of allegorical literature deploying the astral sciences in processes of elevated reasoning. Displaying his philological capabilities across eleven pages of scholastic objections, counter statements, and causal arguments, O'Sullivan Beare interrogated textual evidence of the physical location and properties of purgatory, whose existence the Lutheran creed rejected. Following Thomist teaching, the cyclical nature of the author's argument reflected humanity's departure from, and ultimate return to, God, with grace achieved through the acceptance of Christ, the sacraments, and the refutation of heresy. To bring his topic into the ambit of the Irish cause, he turned to the thirteenth-century Cistercian *Treatise on the Purgatory of Saint Patrick*, a didactic romance predicated on the idea that Christ had shown Patrick a gateway to the underworld on Lough Derg in Donegal. Between the thirteenth and seventeenth centuries the treatise was well known thanks to its appearances in homiletic literature, religious historiography, and works by Ariosto, Erasmus, Rabelais, and Shakespeare (Zaleski 1985, 468, 470–72). Its stratifications of Celtic and Christian allegory enfolded within themselves powerful medieval concepts of pilgrimage, penance, and eschatology, with the protagonist's victory over a monstrous serpent fuel to Gaelic Irish and Anglo-Norman authors alike. This reconstruction of mythemes from shared archipelagic source material was witnessed in narratives of just war authored by Gerald of Wales and allegorically reformed in the works of agents such as Edmund Spenser (1553–99), as well as in the correctives of O'Sullivan Beare and his exiled countrymen. As part of ongoing, historiographical retoolings of the eleventh-century *Lebor Gabála Érenn* (*The Book of the Taking of Ireland*), the soldier-historian wove these "takings" and early modern Irish Catholic identity into a theological tradition to which Albertus Magnus (1200–80) and Thomas Aquinas were meaningful contributors.

While O'Sullivan Beare had assumed this position with brio in the astronomical fragment, his printed argument now functioned rather differently. Strident critique deferred to doubtful circumspection, with the author's rhetorical movement combining literal certainty with a figurative learned ignorance. *Patritiana decas*' cosmogony reflected engagement with common scholastic discourse on the universe, as communicated through contemporaneous interpretations of the Boethian roots of the quadrivium and reified through the *Summa theologica's* second question on the existence of God (O'Sullivan Beare 1629, fols 122r–125r; Aquinas 2006, 20–27). Following Aquinas, O'Sullivan Beare first defended the Deity as the absolute *prima causa* of all following efficient causes, and, by proxy, as the Aristotelian prime mover behind the universe. In support of this argument, the soldier-historian considered and dismissed objections made by figures such as Democritus on infinite causal regress and on the possible multiplicity of worlds with reference to the *Timaeus* and *On the Heavens*, repeating the view that a Democritean plurality of worlds threatened the entire "theological infrastructure" by leaving the Deity with no generative role (Rubenstein 2014, 72–73). Entwining Thomist exposition of both the *Timaeus* and

[37]O'Sullivan Beare 1629, xi, l.33–40. "Notitia varia pulchrum, sermon politum,/Zoilomastix et dicitur illud opus. Tellurisque situm stabilem, Pontique recessus,/Coelorum motus, sydera celsa poli/Ingenio scrutatus acuto, causibus actus/Adversus coeptum rursus omisit opus./Martia complecti cupiens documenta libellis,/Aptius in tempus distulit illud onus."

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Book 3, Chapter 9 of the *Consolation of Philosophy* with scriptural quotation, the author's literary-theological defence of Mosaic physics then segued from thoughts on the eschatological work of Aprigius of Beja (fl.540), written by his erudite friend Acuña, to the concerns of modern *mathematici* (O'Sullivan Beare 1629, fol. 125v).[38]

To explain the relationship between God, the heavens, and the Earth, this centralizing literary tradition had subsumed Neoplatonic and Neopythagorean mathematical cosmologies present in works by Plato (428/427?–348/347 BC), Marcus Manilius (fl. 20 AD), Macrobius (fl. c. 400 AD), and Boethius (c. 477–524 AD).[39] Aping both the content and style of Aquinas' *Summa Theologica*, O'Sullivan Beare cited each of these authors in a quasi-Dantean cosmographic anagogy whose epistemological horizons broadened to synthesize classical and contemporary astronomical theory with biblical exegesis. Though these contemplative efforts were undertaken to understand the objective, Divine perspective, they labored under an essentially anthropocentric subjectivity. The form and physics of the heavens, the Earth, subterranean purgatory, and the fires of hell were all metaphorically geometrized to place the Earth at a central though (almost) maximally distant point from God. The analogical *habitus* employed in praise of this wondrous ineffability was summarized in the Christianized hermeticism that God is an infinite sphere whose center is everywhere and whose circumference is nowhere, the infinite cosmic sphere of Hermes Trismegistus made intelligible yet unimaginable, as in the works of Alain de Lille (1128–1202/3) and Nicholas of Cusa (1401–64) (Harries 1975; Keefer 1998). In Alexandre Koyré's (1957, 15–18) well-known proposal, premodern use of this hermetic apothegm eventually contributed to the view that the Ptolemaic model and its saving of the phenomena was false, and required abandonment.

Now, O'Sullivan Beare's primary quotation from the Book of Job did not concern just the molten firmament, but rather the entire stellar artifice, where God's incredulous interrogation of 38.33, "Knowest thou the ordinances of heaven?," echoed all around. Astronomy was judged a field of bitter contentions and manifold errors, beset by discordant opinions on the number, place, and composition of the world-system (O'Sullivan Beare 1629, fol. 126r).[40] The elegant cosmopoesis provided by the Stoic Manilius (erroneously conflated by the Irish author with Boethius) was little improved by Timocharus and Hipparchus, much less Ptolemy's fabricated celestial orbs and their cycles.[41] Resolutely unimpressed by the addition of further heavens occasioned by Alfonsine observations, the author again derided present-day astronomers as a group of doubtful genius. Some had the gall to demand simple motions of the fixed stars. Others wished to destroy the trio of supra-celestial heavens that accounted for the Mosaic testimony of waters beyond the firmament. More scandalously still, there were those, like Copernicus, who sought to unseat the Earth and to negate the *motus raptus* of the *primum mobile*.[42] Astronomers' misguided accumulations of models threatened the removal of the heavens' transporting impulse, and, as in the case of the "Bourbon" sunspots, proposed the addition of more and more planets of ever smaller orbits. Each of these possibilities bore a distasteful similarity to the Democritean

[38]"Dei vero immensitatem fusius describit Aprigius Episcopus Pacensis Hispanus antiquus scriptor relatus in Domini Francisci Bravi Acunae, iuvenis ornatissimi et eruditissimi lucubrationes, quas brevi edendas esse spero."

[39]On Thomist mathematics, see Maurer (1993) and Palmieri (2009). The literary transmission of Boethius' and Cusanus' mathematics is treated in detailed in Albertson (2014; 2016) and in Oosterhoff (2018, 37–55).

[40]"Unde cap. 38 libri Job merito interrogatur. 'Quis ennerabit coelorum rationem?' . . . De hoc coelo Theologi considerant. De caeteris Astronomi acribus contentionibus, atque multis erroribus, disputant. Eorum enim opiniones de coelorum numero, collocatione, compositione tam variae, et inter dissidentes sunt, ut in multis quaestionibus vera quidem una tantum, false vero omnes esse possint."

[41]O'Sullivan Beare may have come to Manilius' *Astronomicon* via Scaliger, to whom can also be attributed his occasional references to Gerolamo Cardano (1501–76). On Scaliger's philology and exegesis, see Grafton (1983, 180–226).

[42]O'Sullivan Beare 1629, fol. 127r. "Verumenimvero nostro saeculo minime rudes Astronomi prodeunt, qui stellis fixis unum tantum motum concedunt, et tres glaciales, vel crystallinos, vel aqueos coelus funditus tollunt, nullum coelum, cuius raptu reliqui vehnatur, concedentes."

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philosophies Aquinas had repudiated, unsettling the exiled Irish author and throwing all into doubt. Were the heavens simple, he wondered, or were they constituted of a ceaseless plurality of concentric and eccentric orbits? Were epicycles really produced by nature? Did planets and other celestial bodies merely "borrow" their light from the Sun?[43] Beyond these physical questions lay even greater metaphysical issues. Were the heavens moved by God, the creator of all things, by Thomistic-Aristotelian mishmashes of Angelic intelligences, by their own internal force, or, as Ptolemy and others had it, by some combination of each (O'Sullivan Beare 1629, fol. 127r)?

Unnerved by the heretical disestablishment of the Earth's centrality and by the ongoing dissolution of super- and sublunary relationships, the Irish author advised that the only viable option was a pious, apophatic skepticism reliant on the literal word of Scripture. Although contemporary astronomers had scorned philosophers' inquiries into celestial kinematics and their effective causes, such an outlook was itself deserving of derision. No earthly enquiry could provide the necessary answers.[44] In fact, geometrizing the universe was a fool's errand if one failed to maintain an appropriately theological perspective:

> Truly, although the Earth may seem large to us, when sown within the vastness of the entire universe, the wise judge it merely a point. Nor are [these matters] surprising: mathematicians have found many much smaller stars in the firmament. It may be inferred from this, then, that such a point may be considered as having merit, in as much as it may exist in relation to the firmament.[45]

But why, the author railed, should the vast palace of the Empyrean suffer such a comparison? Unashamed of their folly and captivated by "the false values of this very narrow point," heretical astronomers renounced the glory of heaven. In doing so, they risked losing a smaller still orbicular space: the location of Paradise, the generative *punctus* described at length in Genesis.[46] As O'Sullivan Beare had argued in his fragment, the resacralization of the world-system offered by weaving together natural history, literal and anagogical readings of scriptural evidence, and Catholic theology thus "routed" all novel cosmological theories and their paradigm-shifting conclusions completely.

Conclusion: Exegetical astronomy and multi-purpose exegetic reading

Whether in print or manuscript, Philip O'Sullivan Beare was skeptical of the capability of astronomers and natural philosophers to arrive at a cosmology coherent with biblical physics. Despite the commitments made in his *Compendium* and the efforts of *Zoilomastix*, it is easy to imagine bloody experience leading the soldier-historian to question the predictive and propaedeutic powers proposed of the astral sciences. In such a reading, the author's cosmogonic treatment of St. Patrick's purgatory circumscribed his deflated acknowledgment of the limits of

[43]O'Sullivan Beare 1629, fol. 127v. "Caeterum non defunt hodie in Astronomicis rebus non parum versati, qui longe aliter sentiant, planetas quiadem multo plures, coelos tamen eorum integros pauciores esse. . . . Integri vero coeli simplicensne sint, an ex pluribus, orbibus excentricis concentrici constent? Num natura epicyclos ferat? An, ut Luna, sic reliqua sydera lumen a Sole mutuentur? Et quot, quantanque sint ipsa? Dubia video ingeniorum certamina."

[44]O'Sullivan Beare 1629, fol. 127v. "Motuum quidem coelestium causas effectrices Astronomi rejiciunt ad Philosophos investigandas. Sed ne inter hos quidem comperio convenire, utrusque a rerum omnioum conditore Deo tantum, an etiam ab intelligentiis (sic vocant Angelos) and denique interna vi coeli moveantur?"

[45]O'Sullivan Beare 1629, fol. 128r. "Terra vero quamvis nobis ampla videatur, nihilominus si cum totius universatis magnitudine conseratur, a sapientibus puncum iudicatur. Neque mirum, cum singulis illis pellucidis firmamenti stellis multo minor esse a Mathematicis deprehendatur. Quo licet colligi merito punctum haberi, praequam est firmamentum."

[46]O'Sullivan Beare 1629, fol. 128r. "Ad amplissisium vero, atque diffussisimum Empyreum coelum firmament longe maius, Dei omnipotentis regiam beatorumque pati iaquid erit? Heu me! Homines suae stultitiae non pudet, qui falsis angustissimi puncti boniscapti ad Empyreae sedis amplitudine non aspirant! Istitus orbicuil terreni locus amoenissimus est paradisus Genesis fuse descriptus."

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liberal, humanist scholarship, and mark his reflection upon the fault in his own stars as a pawn in a grander game. Yet the prefatory verses pinned to *Patritiana decas* by Jorge Mendoza Afranca suggest the author's ongoing, autodidactic tussle with epistemic genres in service of a comprehensively exegetic *historia*, and it is possible that he continued working on an idiosyncratic natural history whose Mosaic physics contained more technical refutations of the astronomical theory presented in the manuscript fragment. A more speculative history might consider how contemporary works such Scheiner's *Rosa ursina*, full of copious diagrammatic and documentary evidence portraying a semi-Tychonic system commensurate with Scripture and with Bellarmine, impacted upon these efforts.

These suppositions notwithstanding, O'Sullivan Beare clearly saw himself as a dynamic historiographer reading across disciplines to resolve local, national, and universal issues. Such a characterization chimes with active learning practices of the late sixteenth and early seventeenth centuries as refracted through Catholic teaching. The soldier-historian's philological attempts to verify theory and data through linguistic collation and textual comparison emanated from humanist pedagogy and disciplinary practice. The list of authorities witnessed at the beginning of this article was not only an integral portion of this verification through cross-reference, but an exercise in technical historiography continuously repeated in *Zoilomastix*. Here, marginalia indicate the location of sources, agreeable and adversarial reading, and the author's personal *aides-memoire*: in short, a suite of techniques for close study of texts and their content. Following this study, the author's scholastic summary and exposition were inflected with civic and contemplative rhetoric, and with constitutional treatises written before and after Bodin, Lombard, and Bellarmine. Astronomy was a similarly literary affair. As Sacrobosco and his many commentators had, O'Sullivan Beare supplemented Ptolemaic and post-Ptolemaic cosmologies with classical poetry. He then suffused these readings with the hermeneutical *quadriga*, bringing literal, figurative, allegorical, and anagogical forms of biblical interpretation to bear upon new philosophies of the heavens.[47]

Early seventeenth-century readers of natural philosophy were often more concerned with assembling large amounts of sources and testing the underlying validity of hypotheses than they were with establishing a truth-claim's absolute relation to reality. Yet it has been argued that the reception of texts, including Galileo's *Two New Sciences* (1638), reflects the growing consideration readers afforded experiment and personal experience, even as they held to traditional outlooks. In the same period, a surfeit of information in print and manuscript encouraged conception of texts as fluid, ongoing enquiries which might be returned to with remarkable frequency. Consistently retailoring one's reading or writing to different ends was therefore something of a period standard. Such processes in turn encouraged re-engagement with traditional and neoteric forms of argument and demonstration—at times, across shifting philosophical or confessional boundaries (Raphael 2017, 29–30, 49, and 86–87). It is difficult to identify O'Sullivan Beare as a direct reader of the new physico-mathematical astronomy. Yet, as this article has shown, his indirect reception of Galilean theory is readily identifiable through du Chevreul's commentary. *Zoilomastix*'s astronomical fragment is therefore a minor example of the processes of textual layering Raphael identifies, where readers responded to "claims of novelty in terms of methodology and content . . . by drawing on a variety of reading practices and assessing Galileo's texts in light of a range of philosophical opinions" and making sense of new cosmological theories "piecemeal, in less coherent and more eclectic scholarly projects" (Raphael 2017, 46).

Ever subject to political contingency, Philip O'Sullivan Beare's eclectic scholarly project was written in response to dislocation, war, and the whims of sovereign power. Much of his life in exile was spent trying to impress upon arbitrary events a coherent structure and meaning through polemical literature. *Historia*, the discipline which brought together epistemic, erudite, and

[47]On the inheritance of the *quadriga* and its hermeneutic tradition, see Klepper (2016). The tradition's relevance to early modern science is discussed in Harrison (1998) and Holwell (2004).

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exegetic genres, became an ideal tool to define and demonstrate an eternal authority amidst conflicting truth-claims. Ultimately, these efforts proved unsuccessful. His final years in exile were spent sidelined at the Spanish court, largely ignored by the esteemed hagiographers whose ranks he sought to join. This isolation chimes with Seamus Heaney's *Exposure*, where the poet describes comets' "million tons of light/like a glimmer of haws and rose-hips" (Heaney 1975, l.7–8). Heaney's memory of a rain-spattered Wicklow, another famous site of Irish pilgrimage, echoed O'Sullivan Beare's cosmopoetic Lough Derg, where "each drop recalls/the diamond absolutes" of the starry heavens. In their meditations across time and space, the exiled soldier-historian and the poet were "neither internee nor informer," but an "inner émigré, grown long-haired/and thoughtful; a wood-kerne/Escaped from the massacre" (l.28–33). Born into trouble, each man found himself "blowing up these sparks/For their meagre heat"; lamenting having missed the "once-in-a-lifetime portent,/The comet's pulsing rose" (l.37–40).

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Kevin Gerard Tracey combining a background in literary studies with techniques and methodologies from histories of the book, of reading, and of mathematics and science, Kevin Gerard Tracey's research to date has focused on readers at the thresholds of mathematical and scientific understanding, presenting detailed evidence of the spread of mathematical and epistemic cultures in the early modern period. His previous publications include articles and chapters on Ramist mathematical pedagogy in sixteenth- and seventeenth-century Germany and Spain; articles on astronomical teaching and navigational pocketbooks in seventeenth-century England; and articles on Irish exilic engagement with astronomy and natural history.

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